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| 22879 7590 04/28/2008 HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400 | | | | |
| EXAMINER ONTELL, KARIE AMBER | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 1795 | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/699,456

Applicant(s)

CHAMPION ET AL.

Examiner

Karie O'Neill

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20, 48, 49 and 68-71 is/are pending in the application.
- 4a) Of the above claim(s) 5 and 7-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 12-20m 48, 49, 68-71 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Species I: enhancing catalytic activity (all claims readable thereon), an electrolyte substrate (claim 3), doped cubic fluorites as the electrolyte material (claim 4), the electrolyte filament materials for the plurality of nanowires (claim 6) and the cathode as the patterned film (claims 12-14) in the reply filed on January 28, 2008, is acknowledged. Claims 5 and 7-11 have been withdrawn from consideration as being drawn to non-elected species. Claims 21-47 and 50-67 have been canceled. Therefore, Claims 1-4, 6, 12-20, 48, 49 and 68-71 are pending in this office action.

The traversal is on the ground(s) that Examiner has already searched and examined the claims on several occasions and Examiner also has not made a prime facie case of showing a serious burden to further examine the claims without the species restriction. This is not found persuasive because at the time that the Request for Continued Examination (RCE) was filed on December 28, 2007, a review of the pending claims determined that multiple combinations of unrelated species existed that presented undue burden on the search and examination and that an election/restriction requirement was deemed necessary. The necessity in requiring an election of species comes from the multitude of combinations that are possible in unrelated arts. Not only is there an election of species between enhancing catalytic activity or enhancing conductivity, there are also several different and unrelated substrates, several patterned

filmed, and several options for a plurality of nanowires. It was necessary to have Applicant elect certain species in order to determine the scope of the invention so that a complete search could be given to the species of the pending claims at that time. Upon specifying the different species and explaining the possibility of a number of different combinations, burden for examining the distinct species has been shown. Further, if the elected species of claims are not rejected by prior art, other species will be examined.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, 6, 12-13, 15-20, 48, 49 and 68-71 rejected under 35 U.S.C. 102(b) as being anticipated by Seabaugh et al. (US 2003/0027033 A1).

With regard to Claims 1-3, 20, 48, 49 and 71, Seabaugh et al. discloses a solid oxide fuel cell in which power is generated by the transport of ions through an electrolyte membrane sandwiched between electrodes (paragraph 0003). The electrolyte acts as a substrate for a ceramic electrode, the ceramic electrode comprising a mixture of two or more components including at least one nano-scale ionically conducting ceramic electrolyte material and at least one nano-scale powder of an electrode material (paragraph 0002). The inherently patterned electrode/electrolyte

material mixture is established on either side of the electrolyte material when forming the fuel cell. The inherently patterned electrode/electrolyte material mixture, has a plurality of nanoparticles dispersed therein, made up of the mixture of electrolyte nanoparticles and electrode material nanoparticles, and at least one of the plurality of nanoparticles contacting at least an other of the plurality of nanowires; wherein the plurality of nanoparticles enhances catalytic activity of the inherently patterned electrode as the oxygen molecules from air are converted to oxygen ions at the air electrode and these oxygen ions react with hydrogen and carbon monoxide to form water and carbon dioxide at the fuel electrode (see paragraphs 0003-0004 and Claims 1-25). Seabaugh et al. also discloses wherein the fuel cell is device for generating power which is supplied to external devices or a load.

With regard to Claim 4, Seabaugh et al. discloses wherein the electrolyte is at least one of yttrium-stabilized zirconia, gadolinium-doped ceria, a doped ceria electrolyte material, barium zirconate, scandium doped zirconia, a lanthanum gallate based ceramic electrolyte material, a bismuth oxide based electrolyte materials (paragraph 0051). Gadolinium-doped ceria is formed as a single phase with a cubic fluorite structure as is evidenced by Godinho in Influence of Microwave Heating on the Growth of Gadolinium-Doped Cerium Oxide Nanorods on page 384.

With regard to Claim 6, Seabaugh et al. discloses wherein the plurality of nanowires is formed from electrolyte filament materials (paragraphs 0043-0044).

With regard to Claims 12-15, the inherently patterned film comprises a cathode, wherein the plurality of nanoparticles comprises metallic components of cathode

material (paragraph 0045), and wherein the nanoparticles are randomly oriented throughout the electrode material.

With regard to Claims 16-19, Seabaugh et al. discloses wherein the nano-scale electrolyte materials and the nano-scale electrode powder materials are less than 100nm in dimension (paragraph 0009).

With regard to Claim 68, Seabaugh et al. discloses that the ceramic electrode material formed by mixing at least one nano-scale ionically conductive ceramic electrolyte material and at least one nano-scale powder of an electrode material, are useful in fuel cells. It is the position of the examiner that the fuel cell of Seabaugh et al. and the instant application have the same structural features and the ceramic electrode material can be used in the same type of fuel cell. Applicant is advised to submit other information in regard to a single chamber fuel cell if it is shown to be patentably distinct to the invention.

With regard to Claims 69 and 70, Seabaugh et al. discloses wherein a nanoscale powder of electrolyte material and a powder of an electrode (cathode or anode) material are mixed (paragraph 0043).

4. Claims 1-3, 6, 12-16, 18-20, 48, 49 and 68-71 are rejected under 35 U.S.C. 102(b) as being anticipated by Huang et al. (US 2002/0098406 A1).

With regard to Claims 1-3, 20, 48, 49 and 71, Huang et al. discloses a solid oxide fuel cell for automotive and other applications (paragraph 0008), comprising: a substrate made of an electrolyte (Example 1); an inherently patterned paste made up of a plurality

of well-dispersed nano-sized particles of electrocatalytic noble metals and ceramic ionic conducting particles, the plurality of well-dispersed nano-sized particles being established on the electrolyte substrate and increasing the number of sites which enhance catalytic activity (paragraphs 0020-0023, 0043).

With regard to Claim 6, Huang et al. discloses wherein plurality of nano-sized particles is formed from a ceramic ionic conductor made from the same material electrolyte filaments (paragraph 0045).

With regard to Claims 12-14, Huang et al. discloses wherein the inherently patterned paste comprises a cathode, wherein the plurality of nano-sized electrocatalytic noble metal particles are metallic components of cathode material (Example 1), and wherein the cathode metallic comprise at least one of platinum, palladium, rhodium, silver, ruthenium, gold, iridium, osmium or combinations or mixtures thereof (paragraph 0030).

With regard to Claim 15, Huang et al. discloses wherein the plurality of nano-sized particles is randomly oriented throughout the paste (Figure 1).

With regard to Claims 16 and 18-19, Huang et al. discloses the plurality of ceramic ionic conducting particles have a size ranging from 100nm to 200nm (Example 1).

With regard to Claim 68, Huang et al. discloses an inherently patterned paste made up of a plurality of well-dispersed nano-sized particles of electrocatalytic noble metals and ceramic ionic conducting particles being useful in fuel cells. It is the position of the examiner that the fuel cell of Huang et al. and the instant application have the

same structural features and the inherently patterned paste of electrocatalyst materials and ionic conductive material can be used in the same type of fuel cell. Applicant is advised to submit other information in regard to a single chamber fuel cell if it is shown to be patentably distinct to the invention.

With regard to Claim 69, Huang et al. discloses wherein the plurality of nano-sized particles ionic conductive particles is connected to noble metal catalytic nano-sized particles (Figure 1 and paragraph 0042).

With regard to Claim 70, Huang et al. discloses wherein the plurality of nano-sized particles is formed from a ceramic ionic conductor made from the same material electrolyte filaments (paragraph 0045) and wherein the fuel cell further comprises a plurality of nano-sized electrocatalytic noble metal particles made of metallic components of cathode material (Example 1) well-dispersed and connected to the nano-sized particles formed from a ceramic ionic conductor (paragraph 0042).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571)272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1795

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Karie O'Neill
Examiner
Art Unit 1795

KAO

/Mark Ruthkosky/
Primary Examiner, Art Unit 1795